Class name : SY CSE(IOT)
Rollno : 2007
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Batch : S1

EXPERIMENT 8

Implement
various in built functions of Numpy library

a) Using a numpy module create an array and check the following:
1. Type of array
2. Axes of array
3. Shape of array
4Type of elements in array

CODE:-

```
import numpy as np
a = np.array([1,2,3,4,5,6,7,8,90,100])
print("Type of array : ",type(a))
print("Shape of array : ",a.shape)
print("Type of element in array : ",type(a[2]))
```

OUTPUT:-

```
Type of array :  <class 'numpy.ndarray'>
Shape of array :  (10,)
Type of element in array :  <class 'numpy.int32'>

Process finished with exit code 0
```

b) Using a numpy module create array and check the following:
1.List with type float
2. 3*4 array with all zeros
3. From tuple
4. Random values

CODE:-

```
import numpy as np
l1 = [1.0,2.0,3.3,4.5]
a = np.array(l1)
print("Type of array : ",type(a))
b = np.zeros((3,4))
print("Array with all zeros : ")
print(b)
c = (1,2,3,4,5,6,7,8,9,0)
d = np.array(c)
print("Array using typle : ",d)
e = np.random.random((5,5))
print("Array with random values : ", e)
```

OUTPUT:-

```
Type of array :  <class 'numpy.ndarray'>
Array with all zeros :
[[0. 0. 0. 0.]
 [0. 0. 0. 0.]
 [0. 0. 0. 0.]]
Array using typle :  [1 2 3 4 5 6 7 8 9 0]
Array with random values :  [[0.09931435 0.52003407 0.063427   0.0520244  0.96988554]
 [0.50926562 0.23017424 0.50522645 0.75643752 0.23063951]
 [0.65705079 0.94505748 0.46077338 0.85239541 0.66238496]
 [0.36258288 0.30966815 0.28575585 0.54704937 0.06304218]
 [0.46447212 0.77173322 0.23102462 0.29268767 0.53765085]]
```

c) Using a numpy module create array and check the following:

1. Reshape 3X4 array to 2X2X3 array
2. Sequence of integers from 0 to 30 with steps of 5
3. Flatten array
4. Constant value array of complex type

CODE:-

```
import numpy as np
a = np.random.random((3,4))
print("Array with 3*4 Shape : ")
print(a)
a.reshape(2,2,3)
print("Array converted to 2*2*3 : ")
print(a)
b = np.linspace(0,30,5)
print("Array using linspace : ")
print(b)
a.flatten()
print("Array after flatern : ")
print(a)
```

OUTPUT:-

```
Array with 3*4 Shape :
[[0.73574464 0.14061792 0.73093454 0.91534745]
 [0.48548882 0.32623154 0.25864611 0.77599936]
 [0.3945414  0.06050295 0.75229855 0.90546861]]
Array converted to 2*2*3 :
[[0.73574464 0.14061792 0.73093454 0.91534745]
 [0.48548882 0.32623154 0.25864611 0.77599936]
 [0.3945414  0.06050295 0.75229855 0.90546861]]
Array using linspace :
[ 0.   7.5 15.  22.5 30. ]
Array after flatern :
[[0.73574464 0.14061792 0.73093454 0.91534745]
 [0.48548882 0.32623154 0.25864611 0.77599936]
 [0.3945414  0.06050295 0.75229855 0.90546861]]

Process finished with exit code 0
```

d) Using a numpy module create array and perform different statistical operation on array.

CODE:-

```
import numpy as np
a = np.random.random(10)
print(a)
print("Min = ",np.amin(a))
print("Max = ",np.amax(a))
print("Standard deviation = ",np.std(a))
print("Average = ",np.average(a))
print("PTP = ",np.ptp(a))
```

OUTPUT:-

```
[0.71315136 0.7354387  0.77571935 0.65390569 0.461766   0.1256237
 0.07904495 0.85080923 0.89156495 0.25997592]
Min =  0.07904495380235388
Max =  0.8915649476247296
Standard deviation =  0.2869628039280797
Average =  0.5546999851680396
PTP =  0.8125199938223757
```